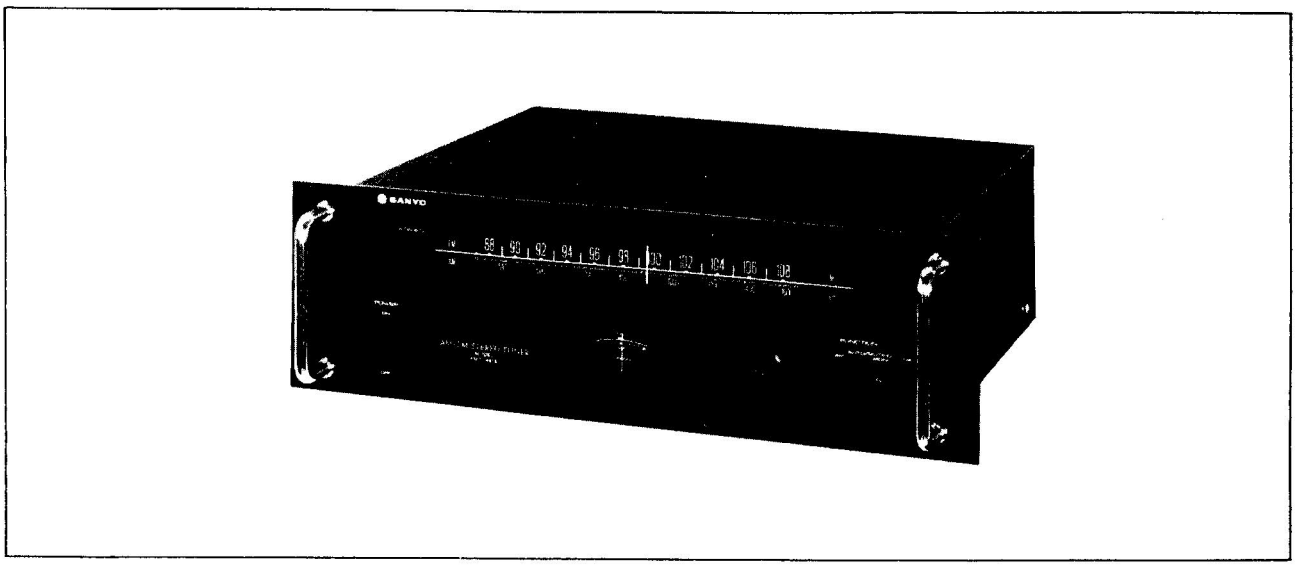
SERVICE MANUAL

STEREO TUNER

SANYO

FMT401K
(SEV)



SPECIFICATIONS (Nominal)

FM SECTION

Tuning Frequency Range		88MHz to 108MHz
Usable Sensitivity (IHF)		2.0μV
IF Rejection		56dB
Image Rejection		55dB
AM Suppresion		55dB
Capture Ratio		1.2dB
Selectivity (IHF)		65dB
Signal-to-Noise Ratio		68dB
Harmonic Distortion	Mono	0.3%
	Stereo	0.4%
Stereo Separation (at 1kHz)		40dB
Tracking Error		300kHz

AM SECTION

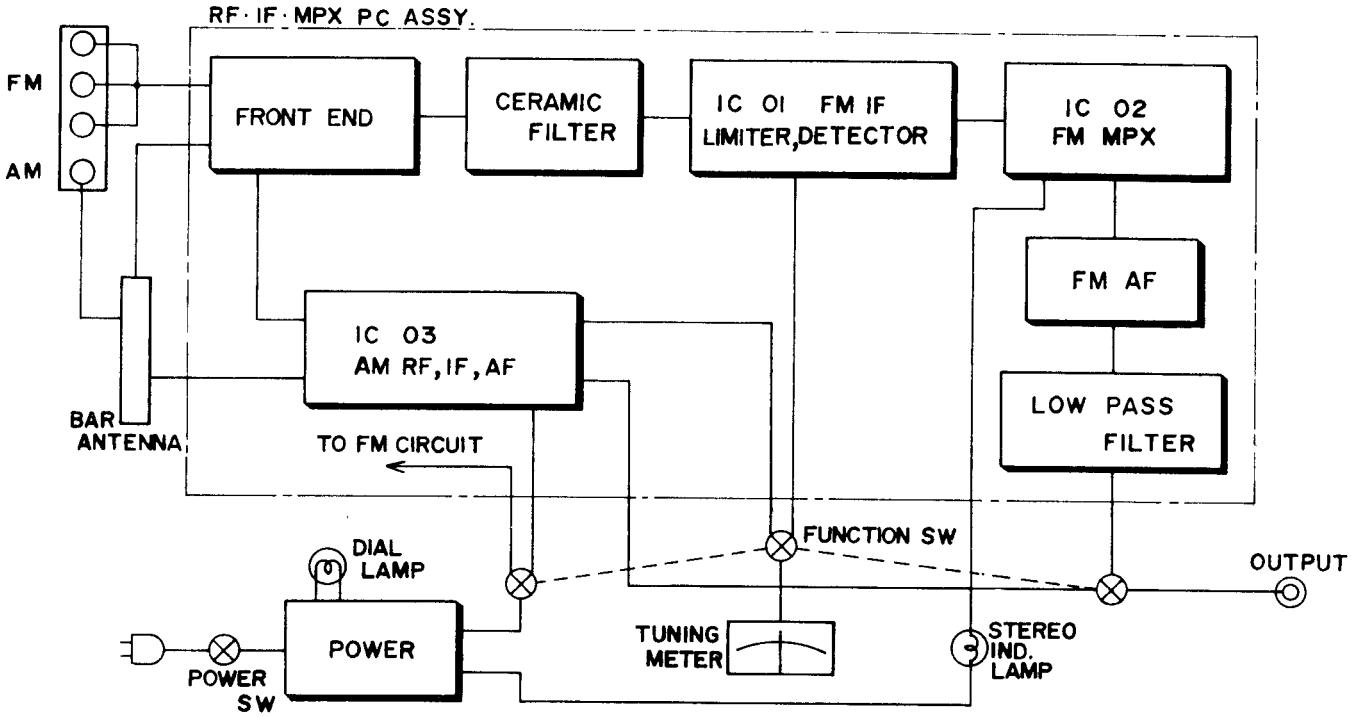
Tuning Frequency Range		535kHz to 1605kHz
Usable Sensitivity (at 20dB Quieting)		300μV/m, 25μV
Image Rejection		50dB
IF Rejection		48dB
Selectivity (IHF)		43dB
Signal-to-Noise Ratio		65dB
Harmonic Distortion		0.3%
Tracking Error		30kHz

GENERAL SECTION

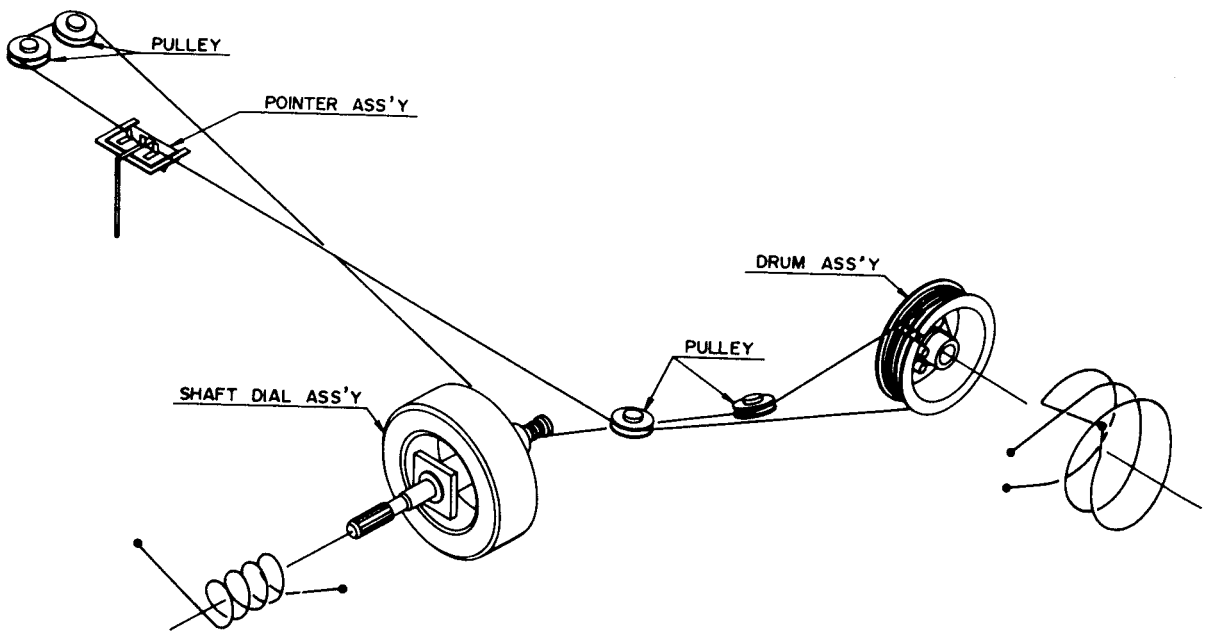
Output (Level/Impedance)		500mV/3k ohm
Power Source (Switchable)	Voltage	110/220V: AC
	Frequency	50 Hz
Power Consumption		10W

—Specifications are subject to change without notice.—

BLOCK DIAGRAM



DIAL CORD STRINGING



AM-FM RF/IF AMP/MPX ADJUSTMENT

AM ADJUSTMENT

Step	Adjusting circuit	Connection		SG. frequency	Position of tuning dial	Adjustment	V.T.V.M. Oscilloscope
		Input	Output				
1	IF	Connect sweep generator to VC4.	Connect oscilloscope to test point TP 19	455 KHz	Near max. capacity of VC at position with no signal.	AM 1st 9-21310 AM DET 9-21291	455 KHz
2	RF	Connect standard loop antenna to output terminal of SG. Place receiver 2 feet from loop antenna	Connect V.T.V.M. to TP 19	600 KHz (400Hz. 30 % modulation)	600 KHz	AM ANT 9-25050 AM OSC 9-20851	Max.
3				1400 KHz (400Hz, 30 % modulation)	1400 KHz	TC4 TC5	Max.
4	Repeat adjustments.						

PREPARE
1. Variable capacitor completely closed.
2. Set the dial pointer to very left line dial scale.
3. Connect sweep generator, SG, V.T.V.M. and oscilloscope.
4. Function switch to "AM."
5. Use a screwdriver with plastic grip for all adjustments.

FM ADJUSTMENT

Step	Adjusting circuit	Connection		SG.frequency	Position of tuning dial	Adjustment	V.T.V.M. Oscilloscope
		Input	Output				
1	IF	Connect sweep generator to test point TP 5 through 0.01μF.	Connect oscilloscope to test point TP 7	10.7 MHz (none modulation)	Near max.capacity of VC. at position with no signal.	IFT In FRONT END	10.7MHz
2	Ratio Det.		Connect oscilloscope to test point TP 6			FM QUADRATURE COIL. 9-21320	
3	RF	Connect FM SG. to FM ANT terminals.	Connect V.T.V.M. to output terminal.	90 MHz (400 Hz, 30 % modulation)	90 MHz	LO, LR	Max.
4				106 MHz (400 Hz, 30 % modulation)	106 MHz	TCA, TCR	Max.
5	Repeat adjustments.						

PREPARE
1. Variable capacitor completely closed.
2. Set the dial pointer to very left line of dial scale.
3. Connect sweep generator, FM SG, V.T.V.M. and oscilloscope. FM ANT input impedance is 300 ohm.
4. Function switch to "FM."
5. Use a screwdriver with plastic grip for all adjustments.

FM MPX ADJUSTMENT

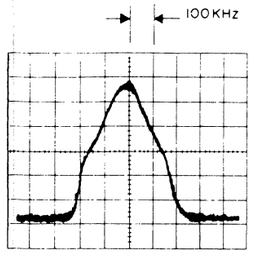
Step	Adjusting circuit	Connection		Position of tuning dial	Adjustment	
		Input	Output			
1	PLL IC FO (19 KHz) Adjustment	None	Connect Frequency counter or synchroscope to TP 8	Near max. capacity of VC. at position with no signal.	Adjust VR 01 (5K-B) so that 19 KHz may be indicated on the frequency counter or synchroscope.	
2	FM STEREO Signal Separation	Connect FM stereo SG to FM ANT terminals. 19 KHz signal ON. Main channel, sub channel signal ON. Add 1000 Hz signal from L Ch.	Connect V.T.V.M. to output terminal (R channel).		VR 02 (1K-B)	V.T.V.M. Min.
		Connect FM stereo SG to FM ANT terminals. 19 KHz signal ON. Main channel, sub channel signal ON. Add 1000 Hz signal from R Ch.	Connect V.T.V.M. to output terminal (L channel)			
3	Repeat steps 1, 2, Set at position with max. channel separation.					

PREPARE
1. Variable capacitor completely closed.
2. Connect FM stereo SG and V.T.V.M.
3. Function switch to "FM"
4. Use a screwdriver with plastic grip for all adjustments.

ALIGNMENT WAVE FORMS

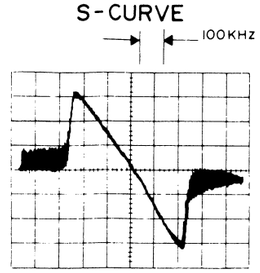
WITH OSCILLOSCOPE TIME BASE SETTINGS

FM IF CURVE



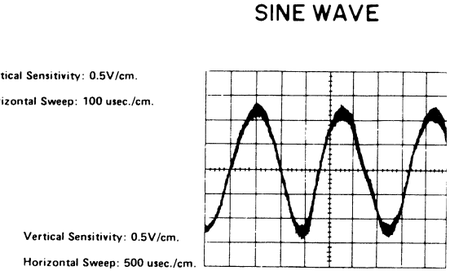
FM IF ALIGNMENT

S-CURVE



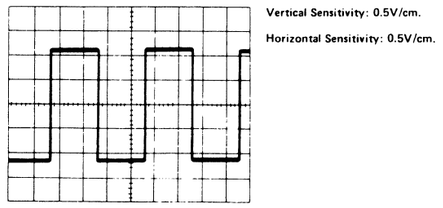
FM DETECTOR ALIGNMENT

SINE WAVE



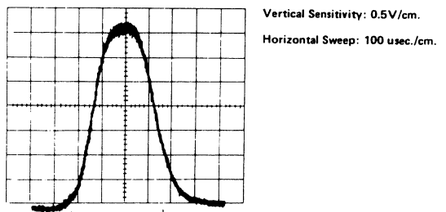
SYMMETRICAL TUNING

SQUARE WAVE



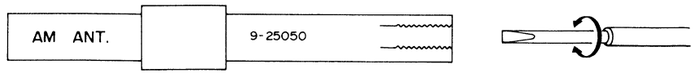
MPX F.R.F.C. ADJUSTMENT

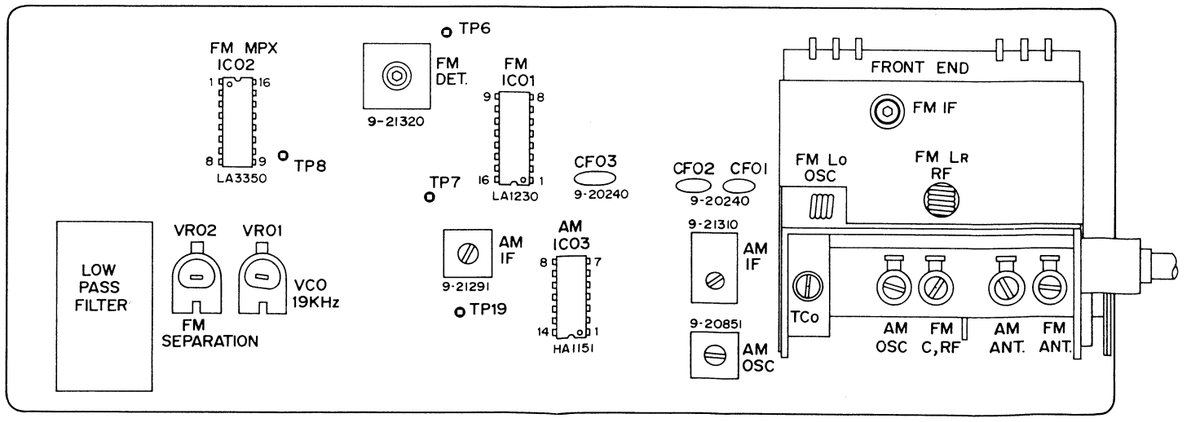
AM IF CURVE



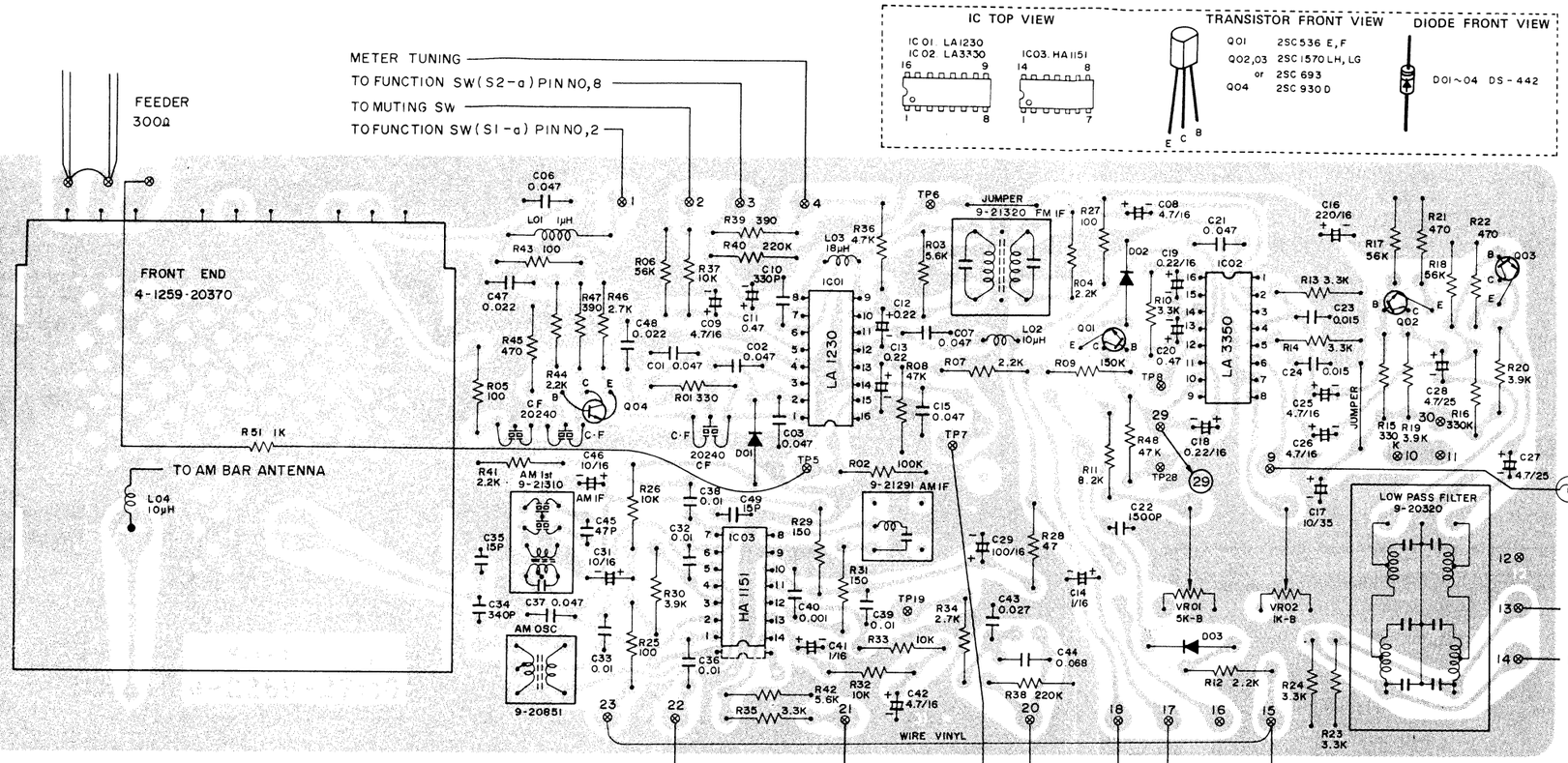
AM IF ALIGNMENT

AM-FM RF/IF MPX BOARD LAYOUT

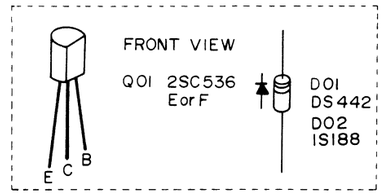




AM-FM RF/IF-MPX P.C.BOARD

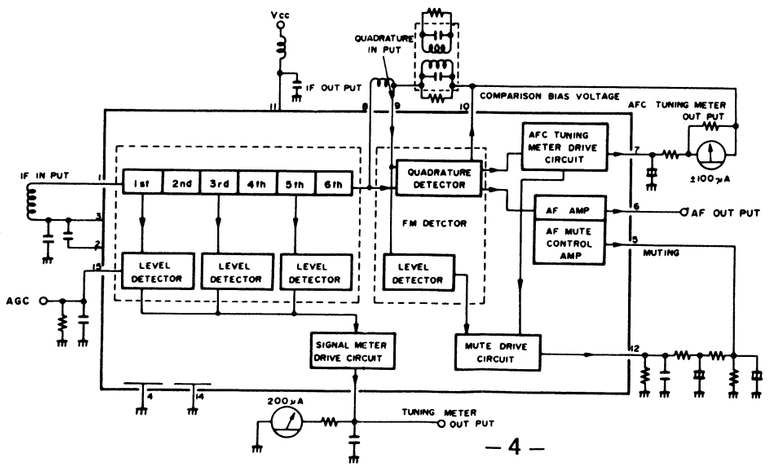


MUTING P.C.BOARD

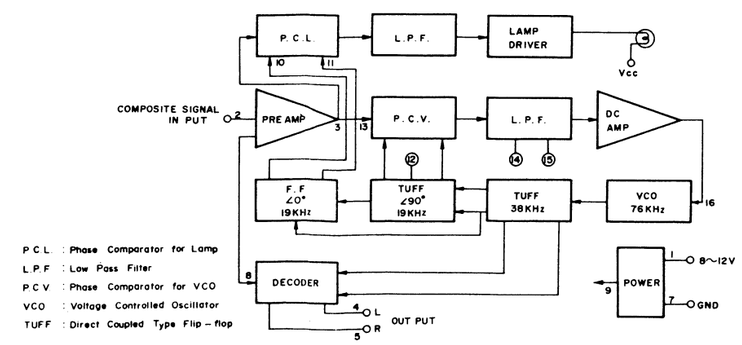


BOTTOM VIEW

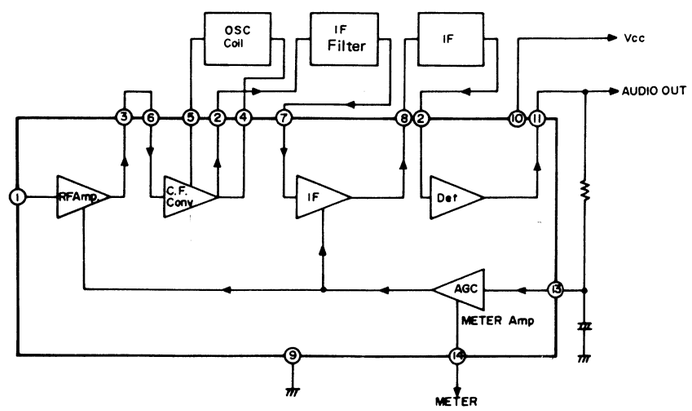
FM IF IC LA1230 SIGNAL FLOW



FM MPX IC LA3350 SIGNAL FLOW



AM RF IF IC HA1151 SIGNAL FLOW

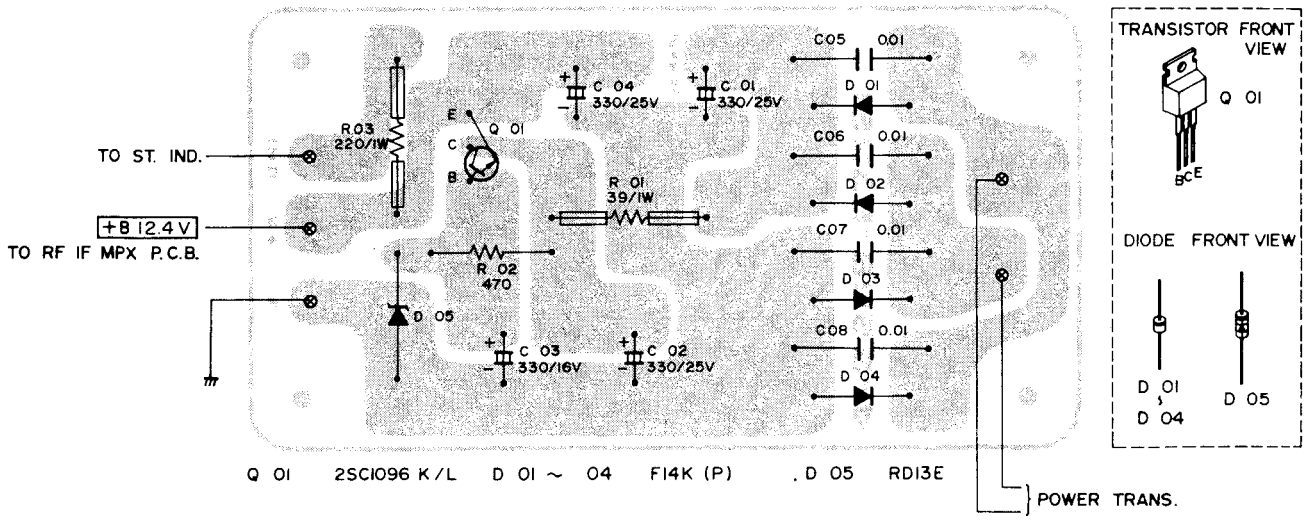


Ref.No.	Parts No.	Description	Q'ty
AM FM RF/IF/MPX PCB ASSY			
67	131 0 4001 80706	RF IF MPX PC Assy	1
	4 1259 20370	Front End (Component parts used in Front End are not serviceable and available.)	1
VR01	4 2229 22842	VR B-5k (19kHz)	1
VR02	4 2229 24210	VR 1KB (SEPA CON)	1
	4 2279 20240	Ceramic Filter	3
	4 2279 20320	Low Pass Filter	1
	4 2569 21291	IF Trans AM Black	1
	4 2569 21310	IF Trans AM Red	1
	4 2569 21320	IF Trans FM Quadrature	1
	4 2589 20851	OSC Coil AM Red	1
L01	4 2539 20120	IF Trap 1μH	1
L02	4 2539 20370	10μH ±10 %	1
L03	4 2539 20380	18μH ±5 %	1
L04	4 2539 20430	Peaking Coil 10 μH	1
	4 2359 22980	Socket 16P (IC)	1
CAPACITORS			
C01,02 C03	C1HBDM473W	Ceramic 0.047μF 50V ±20 %	3
C06,07	C1HYSZ473A	Ceramic 0.047μF 50V +80 −20 %	2
C08	C1CUEX475A	Alsicon 4.7 μF 16V +40 −20 %	1
C09	C1CRE-475A	Electrolytic 4.7μF 16V	1
C10	C1HCSK331SL	Ceramic 330pF 50V ±10 %	1
C11	C1CUEX474A	Alsicon 0.47μF 16V +40 −20 %	1
C12,13	C1CUEX224A	Alsicon 0.22μF 16V +40 −20 %	2
C14	C1CRE-105A	Electrolytic 1μF 16V	1
C15	C1HYSZ473A	Ceramic 0.047μF 50V +80 −20 %	1
C16	C1CRE-227A	Electrolytic 220μF 16V	1
C17	C1VRE-106A	Electrolytic 10μF 35V	1
C18,19	C1CUEX224A	Alsicon 0.22μF 16V +40 −20 %	2
C20	C1CUEX474A	Alsicon 0.47μF 16V +40 −20 %	1
C21	C1HFRM473A	Mylar 0.047μF 50V ±20 %	1
C22	C1HSEJ152A	Styrol 1500pF 35V ±5 %	1
C23,24	C1HFRK153A	Mylar 0.015μF 50V ±10 %	2
C25,26	C1CUEX475A	Alsicon 4.7μF 16V ±20 %	2
C27,28	C1VTRM475A	Tantal 4.7uF 35V ±20 %	2
C29	C1CRE-107A	Electrolytic 100μF 16V	1
C31	C1CRE-106A	Electrolytic 10μF 16V	1
C32,33	C1HFRM103A	Mylar 0.01μF 50V ±20 %	2
C34	C1HSEJ341A	Styrol 340pF 50V ±5 %	1
C35	C1HCSJ150WK	Ceramic 15p 50V ±5 %	1
C36	C1HFRM103A	Mylar 0.01μF 50V ±20 %	1
C37	C1HYSZ473A	Ceramic 0.047μF 50V +80 −20 %	1
C38,39	C1HFRM103A	Mylar 0.01μF 50V ±20 %	2
C40	C1HFRM102A	Mylar 0.001μF 50V ±20 %	1
C41	C1CUEX105A	Alsicon 1μF 16V +40 −20 %	1
C42	C1CRE-475A	Electrolytic 4.7μF 16V	1
C43	C1HFRM273A	Mylar 0.027μF 50V ±20 %	1
C44	C1HFRK683A	Mylar 0.068μF 50V ±20 %	1
C45	C1HCSK470SL	Ceramic 47pF 50V ±10 %	1
C46	C1CRE-106A	Electrolytic 10μF 16V	1
C47,48	C1HYSZ223A	Ceramic 0.022μF 50V +80 −20 %	2
C49	C1HCSJ150SL	Ceramic 15pF 50V ±5 %	1
SEMICONDUCTORS			
D01,02 D03	205 5 9040 44210	Diode DS-442	3
IC01	206 5 0151 23010	IC LA-1230	1
IC02	206 5 0473 35010	IC LA-3350	1
IC03	IKK-HA1151	IC HA-1151	1
Q01	203 5 5100 53650	TR 2SC 536	1
Q02,03	203 5 5151 57079	TR 2SC1570LG	2
Q04	203 5 5500 93040	TR 2SC 930 D	1
RESISTORS			
R01	R2EDSJ331A	Carbon 330 1/4W ±5 %	1
R02	R2EDSJ104A	Carbon 100 k 1/4W ±5 %	1

NOTES:
1. Part orders must contain Model Number. Part Number and Description.
2. Ordering quantity of screws and/or resistors must be multiple of 10 pcs.

Ref.No.	Parts No.	Description	Q'ty
RESISTORS			
R03	R2EDSJ562A	Carbon 5.6 k 1/4W ±5 %	1
R04	R2EDSJ222A	Carbon 2.2 k 1/4W ±5 %	1
R05	R2EDSJ101A	Carbon 100 1/4W ±5 %	1
R06	R2EDSJ563A	Carbon 56 k 1/4W ±5 %	1
R07	R2EDSJ222A	Carbon 2.2 k 1/4W ±5 %	1
R08	R2EDSJ473A	Carbon 47 k 1/4W ±5 %	1
R09	R2EDSJ154A	Carbon 150k 1/4W ±5 %	1
R10	R2EDSJ332A	Carbon 3.3 k 1/4W ±5 %	1
R11	R2EDSJ822A	Carbon 8.2 k 1/4W ±5 %	1
R12	R2EDSJ222A	Carbon 2.2 k 1/4W ±5 %	1
R13,14	R2EDSJ332A	Carbon 3.3 k 1/4W ±5 %	2
R15,16	R2EDSJ334A	Carbon 330k 1/4W ±5 %	2
R17,18	R2EDSJ563A	Carbon 56k 1/4W ±5 %	2
R19,20	R2EDSJ392A	Carbon 3.9k 1/4W ±5 %	2
R21,22	R2EDSJ471A	Carbon 470 1/4W ±5 %	2
R23,24	R2EDSJ332A	Carbon 3.3k 1/4W ±5 %	2
R25	R2EDSJ101A	Carbon 100 1/4W ±5 %	1
R26	R2EDSJ103A	Carbon 10 k 1/4W ±5 %	1
R27	R2EDSJ101A	Carbon 100 1/4W ±5 %	1
R28	R2EDSJ470A	Carbon 47 1/4W ±5 %	1
R29	R2EDSJ151A	Carbon 150 1/4W ±5 %	1
R30	R2EDSJ392A	Carbon 3.9 k 1/4W ±5 %	1
R31	R2EDSJ151A	Carbon 150 1/4W ±5 %	1
R32,33	R2EDSJ103A	Carbon 10 k 1/4W ±5 %	2
R34	R2EDSJ272A	Carbon 2.7 k 1/4W ±5 %	1
R35	R2EDSJ332A	Carbon 3.3 k 1/4W ±5 %	1
R36	R2EDSJ472A	Carbon 4.7 k 1/4W ±5 %	1
R37	R2EDSJ103A	Carbon 10 k 1/4W ±5 %	1
R38	R2EDSJ224A	Carbon 220k 1/4W ±5 %	1
R39	R2EDSJ391A	Carbon 390 1/4W ±5 %	1
R40	R2EDSJ224A	Carbon 220 k 1/4W ±5 %	1
R41	R2EDSJ222A	Carbon 2.2 k 1/4W ±5 %	1
R42	R2EDSJ562A	Carbon 5.6k 1/4W ±5 %	1
R43	R2EDSJ101A	Carbon 100 1/4W ±5 %	1
R44	R2EDSJ222A	Carbon 2.2 k 1/4W ±5 %	1
R45	R2EDSJ471A	Carbon 470 1/4W ±5 %	1
R46	R2EDSJ272A	Carbon 2.7k 1/4W ±5 %	1
R47	R2EDSJ391A	Carbon 390 1/4W ±5 %	1
R48	R2EDSJ473A	Carbon 47 k 1/4W ±5 %	1
R51	R2EDPJ102A	Carbon 1k 1/4W ±5 %	1
MUTING PCB ASSY			
69	131 0 4001 80600	Muting PCB Assy	1
VR01	4 2229 25100	Semi-Fixed VR 47k-B	1
SEMICONDUCTORS			
D01	205 5 9040 44210	Diode DS-442	1
D02	202 5 9110 18820	Diode 1S188 FM1	1
Q01	203 5 5100 53660	TR 2SC536 F	1
RESISTORS			
R02	R2EDSJ103A	Carbon 10k 1/4W ±5 %	1
R03	R2EDSJ472A	Carbon 4.7k 1/4W ±5 %	1
R04	R2EDSJ474A	Carbon 470k 1/4W ±5 %	1
POWER SUPPLY PCB ASSY			
68	131 0 4001 70601	Power Supply PC Assy	1
CAPACITORS			
C01,02 04	C1ERE-337A	Electrolytic 330 μF 25V	3
C03	C1CRE-337A	Electrolytic 330 μF 16V	1
C05,06 07,08	C2HYDP103A	Ceramic 0.01 μF 50V +100,−0 %	4
SEMICONDUCTORS			
D01,02 03,04	DNN-F-14K(P)	Diode F-14K	4
D05	DNN-RD13E	Diode RD-13E	1
Q01	TNN-2SC1096-L	TR 2SC1096 L	1
RESISTORS			
R01	R3AXPK390A	Oxide Metal Film 39 1W ±10 %	1
R02	R2EDSJ471A	Carbon 470 1/4W ±5 %	1
R03	R3AXPK221A	Oxide Metal Film 220 1W ±10 %	1

POWER SUPPLY P.C.BOARD



BOTTOM VIEW

PARTS LIST

Ref.No.	Parts No.	Description	Q'ty
	PACKING		
	131 6 1139 58812	Box Corrugate-EXP	1
	131 6 2119 01550	Bag Polyethylene-EXP	1
	131 6 3009 21420	Pad (Corner)	1
	131 6 3069 16150	Patching Sheet	1
	CABINET		
1	131 2 1410 13401	Cover	1
2	131 2 5205 15400	Cushion	1
3	131 2 5206 12900	Mold Plane	2
4	131 2 1105 15403	Plate Bottom	1
5	131 2 1801 13300	Leg	4
	APPEARANCE		
6	131 0 1002 10300	Handle Assy	2
7	131 0 3011 16400	Pointer Sssy	1
8	131 2 1116 15000	Frame	1
9	131 2 1201 27901	Plate Dial	1
10	131 2 1203 34201	Panel Control	1
11	131 2 1503 12202	Decorate Sign	1
12	131 2 1601 39201	Knob (Power SW)	1
13	131 2 1601 39700	Knob (Tuning)	1
14	131 2 1601 39800	Knob (Function)	1
15	131 2 3304 16200	Plate Dial Rear	1
16	131 2 4208 22600	Spacer (Tuning Meter)	1
17	131 2 5205 16000	Cushion (Pointer)	1
18	131 2 5205 16100	Cushion (Panel Control)	2
19	131 2 5205 16200	Cushion (Panel Control)	2
20	131 2 6113 23000	Shelter (Plate Dial)	2
21	131 2 6113 23100	Shelter (Plate Dial)	2

Ref.No.	Parts No.	Description	Q'ty
	CHASSIS		
23	131 0 3002 11300	Drum Assy	1
24	131 0 3003 20100	Shaft Dial Assy	1
25	131 0 3008 11800	Support Antenna Assy	1
26	131 2 5205 15100	Cushion (Tuning Meter)	1
27	131 2 3101 46900	Metal Mount (Fuse Holder)	1
28	131 2 3305 19900	Panel Front	1
29	131 2 3306 21805	Panel Rear	1
30	131 2 3308 12400	Chassis Sub	2
31	131 2 3406 11000	Metal Mout IND	1
32	131 2 3614 18101	Mount Pring C Bord	2
33	131 2 4107 10300	Pulley	3
34	131 2 4108 10300	Spindle Pulley	2
35	131 2 4111 00400	Spring Rope	1
36	131 2 4112 10200	Rope 0.5	
38	131 2 6111 10300	Bushing (Pilot Lamp)	3
39	131 2 6111 11601	Bushing (Stereo IND)	1
40	131 2 6111 14200	Bushing (AC Cord)	1
41	131 2 7103 26505	Label (Fuse Holder)	1
43	131 2 5206 13000	Mold Plane (Panel Front)	2
44	131 2 3617 16000	Metal Mount Trans	1
59	131 2 3101 50200	Metal Mount (AC Selector)	1
60	131 2 3614 17100	Mount Pring C Board	2
61	131 2 3101 46800	Metal Mount (Shaft Deal Assy)	1
62	131 2 3202 12001	Metal Reinf	1
63	131 2 7104 00500	Plate Pad Switch	1
65	131 2 6111 14200	Bushing (ANT Cord)	1

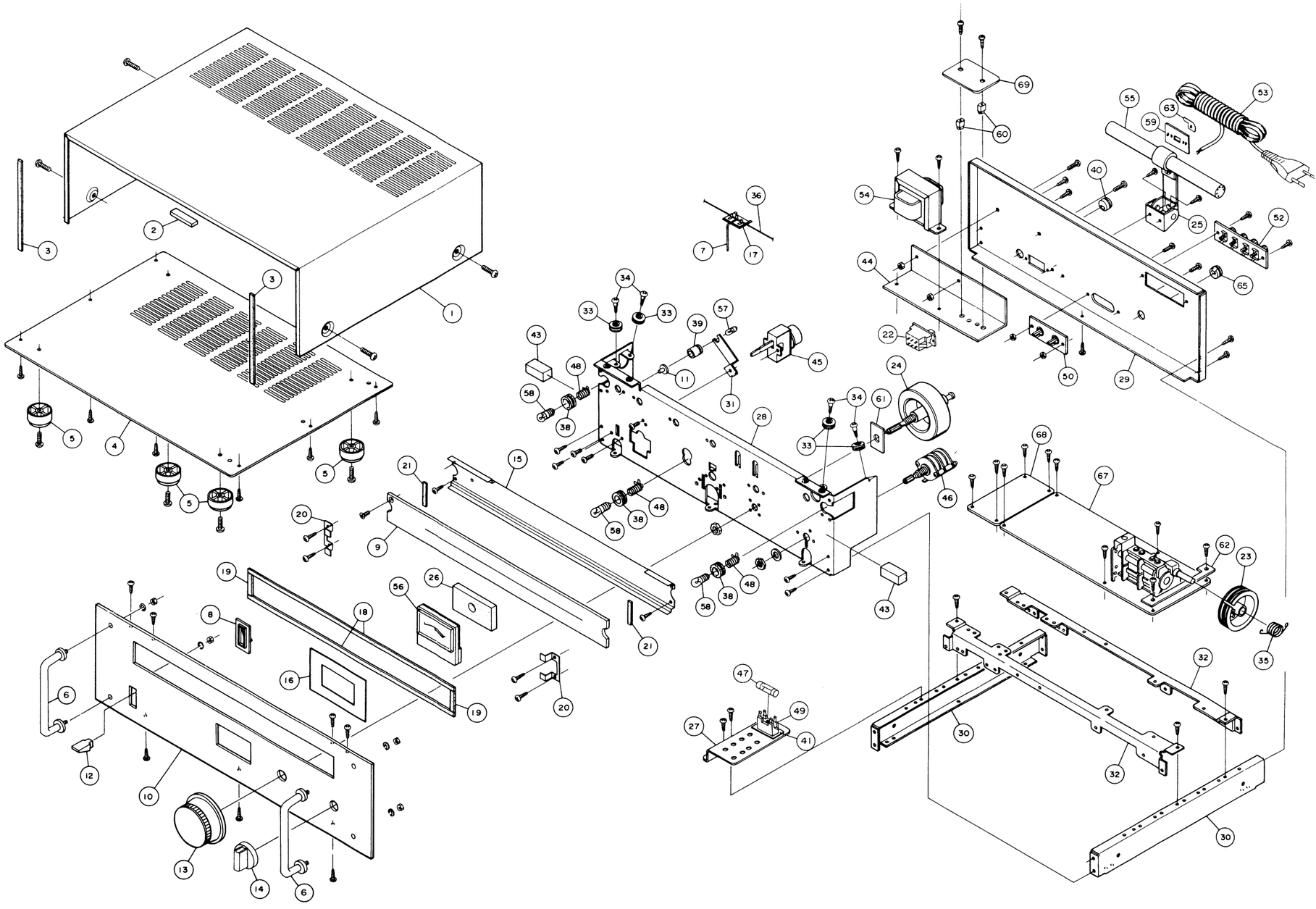
NOTES:
1. Part orders must contain Model Number. Part Number and Description.
2. Ordering quantity of screws and/or resistors must be multiple of 10 pcs.

PARTS LIST

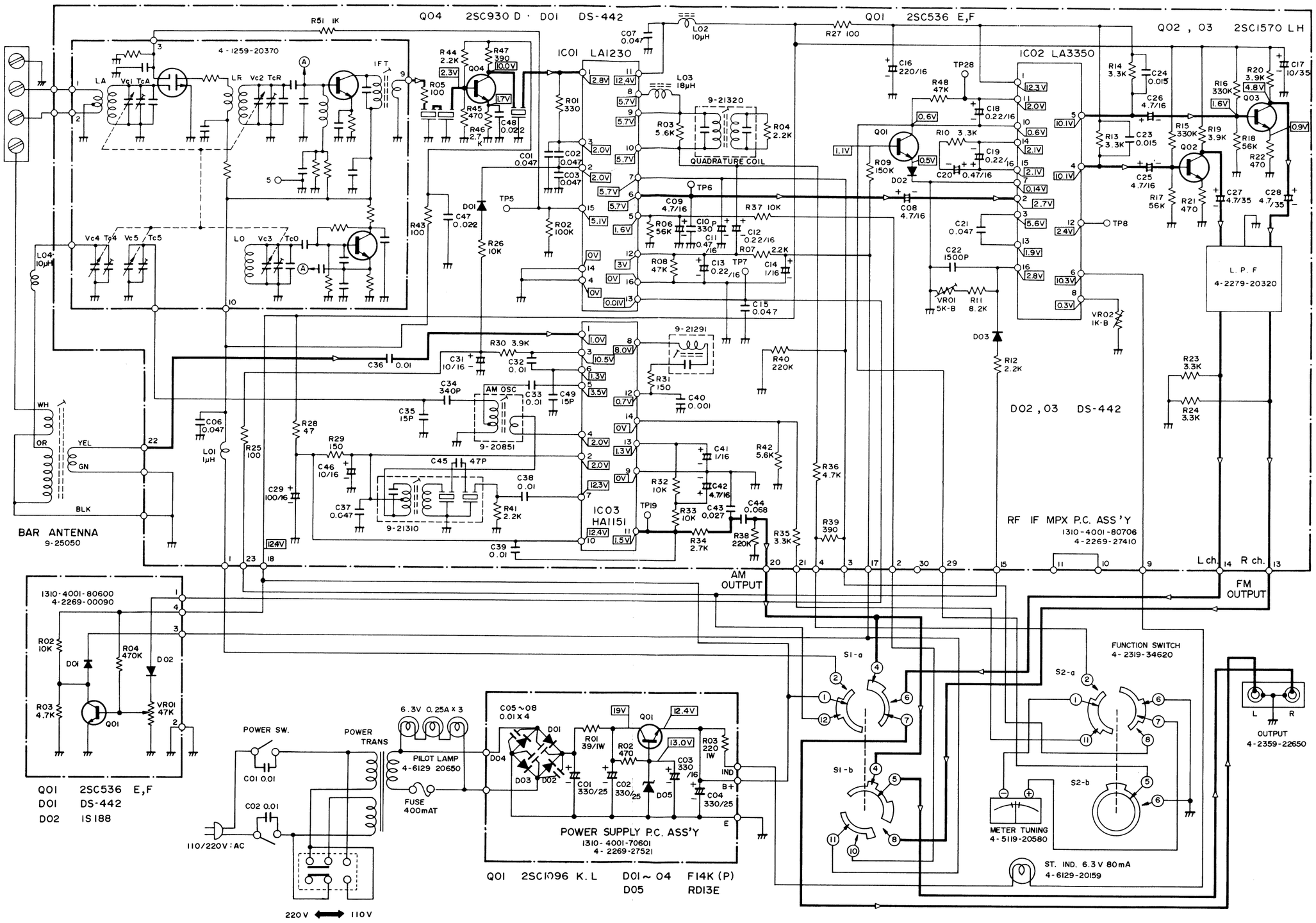
Ref.No.	Parts No.	Description	Q'ty
	ELECTRICAL PARTS		
22	4 2359 21530	Switch Slide 6P	1
45	4 2319 24383	SW Lever 4P (Power SW)	1
46	4 2319 34620	SW Rotary (Function SW)	1
47	4 2349 20131	Fuse 400mA	1
48	4 2359 20970	Socket PL (Dial Lamp)	1
49	4 2359 21021	Fuse Holder (AC Fuse)	1
50	4 2359 22650	Socket Phono 2P (Output)	1
52	4 2379 21460	Terminal 4P (EXT ANT Input)	1
53	4 2439 20526	Power Cord	1
54	4 2519 23817	Power Trans	1
55	4 2579 25050	Bar Antenna AM	1
56	4 5119 20580	Meter Tuning	1
57	4 6129 20159	Pilot Lamp (ST IND 6.0V 25mA)	1
58	4 6129 20650	Pilot Lamp (6.3V 250mA)	3
C01,02	C2HYDP103A	Ceramic 0.01 μF 500V +100,–0 %	1

NOTES:
1. Part orders must contain Model Number. Part Number and Description.
2. Ordering quantity of screws and/or resistors must be multiple of 10 pcs.

CABINET & CHASSIS EXPLODED VIEW



SCHEMATIC DIAGRAM



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